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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/700,359

11/04/2003

Vijayen S. Veerasamy

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EXAMINER

TUROC, DAVID P

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

07/31/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/700,359	Applicant(s) VEERASAMY, VIJAYEN S.	
	Examiner DAVID TUROCY	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 and 49-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-32 is/are allowed.
- 6) ☒ Claim(s) 49-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's amendments, filed 6/3/2008, have been fully considered and reviewed by the examiner. The examiner notes the amendment to claim 54. Claims 1-32 and 49-55 are pending in the instant application.

Response to Arguments

2. Applicant's arguments, filed 6/3/2008, with respect to 35 USC 112 first paragraph rejection over claims 30-32 have been fully considered and are persuasive. The rejection of the claims has been withdrawn.

3. Applicant's arguments filed 6/3/2008, directed at the have been fully considered but they are not persuasive. The applicant has argued against the 35 USC 112 1st paragraph scope of enablement rejections, stating that the specification discloses other metal nitride layers, and therefore enables the entire scope of the claims. The examiner disagrees and while notes that metal nitride layers are supported, the claim is open to any film and determining whether the film will be phase transformed upon heating will require undue experimentation as discussed below.

4. The applicants argue paragraph 0012 discloses "the metal may be Zr, or any other suitable metal or metal alloy" and thus the specification is enabled for the entire scope of the claim. This is erroneous. Specifically, the line of support of the applicant only modifies type of metal nitride discussed in the prior sentence. Therefore, as evidence in paragraph 3 above, the examiner agrees that the specification enables

metal nitride conversion to metal oxide, but phrase does not reasonably support all phase transformed layers as discussed in the 35 USC 112 1st paragraph rejection. Accordingly, the examiner has withdrawn the prior 35 USC 112 1st paragraph rejection over claims 49-55; however, upon further consideration, a new ground(s) of rejection is made below.

Terminal Disclaimer

5. The terminal disclaimer filed on 6/3/2008 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 7150849 and US patent Application 11/586693 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 49-53 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the deposition of a DLC layer on a metal nitride layer, does not reasonably provide enablement for all layers “phase-transformed during heat treatment”. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. The nature of the invention involves

application of DLC on a “phase-transformed during heat treatment” selected from a seemingly infinite number of layers, and then burning off the carbon layer to transform the phase transformed layer to a new phase. The state of the prior art is silent to various “phase-transformed during heat treatment” capable of being utilized in such a manner and while the skill of one ordinary in the art is relatively high, the claims required a chemical reactions and conversions of coatings which is a highly exact science with little predictability. Additionally, while the specification clearly describes with sufficient specificity the application of the species of DLC carbon, followed by combustion, results in the proper conversion of ZrN to ZrO (or broadly a metal nitride to a metal oxide), the specification fails to include any working examples or direction as to a representative number of species of the seemingly infinite number of possible layers of “phase-transformed during heat treatment”, that would result in the proper conversion without undue experimentation. This undue experimentation would encompass determining which “phase-transformed during heat treatment” comprising layers successfully transform into a new phase upon heat treatment with a DLC layer as required by the present claims. See *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

8. Claim 54 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the deposition of a DLC layer on a metal nitride layer, does not reasonably provide enablement for all carbon containing layers. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with

these claims. The nature of the invention involves application of carbon comprising layer, selected from a seemingly infinite number of layers on a layer to be phase-transformed during heat treatment, and then burning off the carbon layer to transform the phase transformed layer to a new phase. The state of the prior art is silent to various carbon films that are capable of being utilized in such a manner and while the skill of one ordinary in the art is relatively high, the claims required a chemical reactions and conversions of coatings which is a highly exact science with little predictability. Additionally, while the specification clearly describes with sufficient specificity the application of the species of DLC carbon, followed by combustion, results in the proper conversion of ZrN to ZrO, the specification fails to include any working examples or direction as to a representative number of species of the seemingly infinite number of possible layers of carbon inclusive layers that combust and provide a layer to be “phase-transformed during heat treatment”, that would result in the proper conversion without undue experimentation. This undue experimentation would encompass determining which carbon inclusive layers successfully combust and then transform another layer into a new phase upon heat treatment with of the carbon layer as required by the present claims. See *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

9. Claim 54-55 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the deposition of a DLC layer on a metal nitride layer, does not reasonably provide enablement for all Zr comprising layers. The specification does not enable any person skilled in the art to which it pertains, or with

which it is most nearly connected, to make the invention commensurate in scope with these claims. The nature of the invention involves application of DLC on a layer comprising at least Zr to be phase-transformed during heat treatment selected from a seemingly infinite number of layers, which comprise Zr, and then burning off the carbon layer to transform the phase transformed layer to a new phase. The state of the prior art is silent to various Zr films that are “phase-transformed during heat treatment” capable of being utilized in such a manner and while the skill of one ordinary in the art is relatively high, the claims required a chemical reactions and conversions of coatings which is a highly exact science with little predictability. Additionally, while the specification clearly describes with sufficient specificity the application of the species of DLC carbon, followed by combustion, results in the proper conversion of ZrN to ZrO, the specification fails to include any working examples or direction as to a representative number of species of the seemingly infinite number of possible layers of Zr inclusive “phase-transformed during heat treatment”, that would result in the proper conversion without undue experimentation. This undue experimentation would encompass determining which Zr inclusive “phase-transformed during heat treatment” comprising layers successfully transform into a new phase upon heat treatment with a DLC layer as required by the present claims. See *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

Allowable Subject Matter

10. Claims 1-32 are allowed.

11. The following is a statement of reasons for the indication of allowable subject matter: None of the prior art cited or reviewed by the applicant reasonably teaches or suggestion a metal nitride (or ZrN film) with a DLC film thereon and heating the layers to combust the DLC and convert nitride to oxide.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID TUROCY whose telephone number is (571)272-2940. The examiner can normally be reached on Monday-Friday 8:30-6:00, No 2nd Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/David Turocy/

Patent Examiner, Art Unit 1792